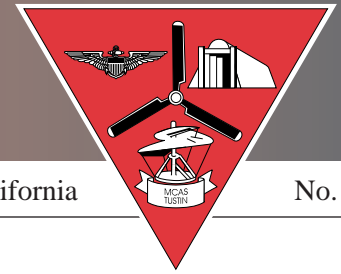


# The Environmental Cleanup of Marine Corps Air Station Tustin

October 1996

Tustin, California

No. 6



## Proposed Plan for Landfill Trenches and Crash Crew Burn Pits

**T**he purpose of this Proposed Plan fact sheet is to provide an overview of the environmental investigation's results at the Moffett Trenches and Crash Crew Burn Pits area of MCAS Tustin. It also presents an evaluation of a proposed cleanup and control system for this area and notifies the public of opportunities to comment on proposed plans.

A Remedial Investigation report prepared by the Marine Corps/Navy details the results of the chemical investigation in this area, originally established as Installation Restoration Program (IRP) Site 1. The report, which is now available for public review, also addresses the evaluation of the existing containment system and the human health and ecological risk. Based on the results of the investigation, the Marine Corps/Navy has determined that the site poses no significant risk to the public in its current condition or after the completion of the area's reuse plan.

The Proposed Plan fact sheet also outlines the range of cleanup (or remedial action) alternatives considered for this area of the base and discusses the Marine Corps/Navy's preferred alternative for future management of the chemicals found at the site. In discussing these alternatives, the Base Realignment and Closure (BRAC) Cleanup Team has created what are known as "operable units (OUs)," which identify and describe a number of separate activities undertaken as part of the basewide cleanup. The Marine Corps/Navy is now accepting comments on the alternatives presented in this document, as well as on the Feasibility Study report that details the evaluation criteria and the analysis of alternatives.

The Marine Corps/Navy's preferred alternative, in addition to the existing system (see section

**CONTINUED ON PAGE 2** ➔

### Opportunities for Community Involvement

#### Community Meeting: Thursday, November 7

You are invited to a meeting at the **Tustin City Hall, Clifton Miller Room, 300 Centennial Way, from 7:00 to 9:00 p.m.**, to discuss the proposed alternatives for Operable Unit 3 (the Moffett Trenches and Crash Crew Burn Pits site) at MCAS Tustin. Marine Corps/Navy representatives will report on the investigation and cleanup alternatives, including their preferred alternative. At this meeting you will have the opportunity to ask questions about and to comment on the alternatives.

#### Comment Period: October 18 – November 16, 1996

We encourage you to comment on the alternatives and site-related documents during the public comment period. Comments may be submitted orally or in writing at the community meeting, or you can mail written comments postmarked no later than November 16, 1996 to: Steven Matthews, Community Point-of-Contact, MCAS Tustin, Attn: HQ, BRAC, Code 2AS, P.O. Box 105001, Santa Ana, CA 92710-5001. Comments may also be faxed to (714) 726-5310.

Substantive comments will be considered in the selection of the final cleanup plan, and responses will be provided for all significant comments. These comments will be addressed in a document called a Responsiveness Summary. The Responsiveness Summary, together with the Record of Decision, will formally document the specific remedial activities which will be implemented for this site.

This is the sixth fact sheet in a series of communications issued during the environmental restoration process at Marine Corps Air Station (MCAS) Tustin. To guide the Marine Corps/Navy through the environmental restoration process, the Department of Defense's Installation Restoration Program is being implemented at MCAS Tustin. Under this program, a series of steps are followed to effectively manage the overall investigation and cleanup activities at the base. This fact sheet summarizes the activities and conclusions of the Remedial Investigation and Feasibility Study at the Moffett Trenches and Crash Crew Burn Pits site. Watch for updates that will detail future environmental activities and explain their importance in preparing MCAS Tustin for reuse and transfer to the public.

CONTINUED FROM PAGE 1

- monitoring of groundwater and surface water to track the movement of chemicals and to document the progress of naturally-occurring biodegradation;
- inspection and maintenance of the Gunite™ wall currently in place along Peters Canyon Channel;
- deed, or land use, restrictions;
- periodic reviews of the effectiveness of these activities; and
- contingency plan should migration of contaminants occur at levels not protective of human health or the environment.

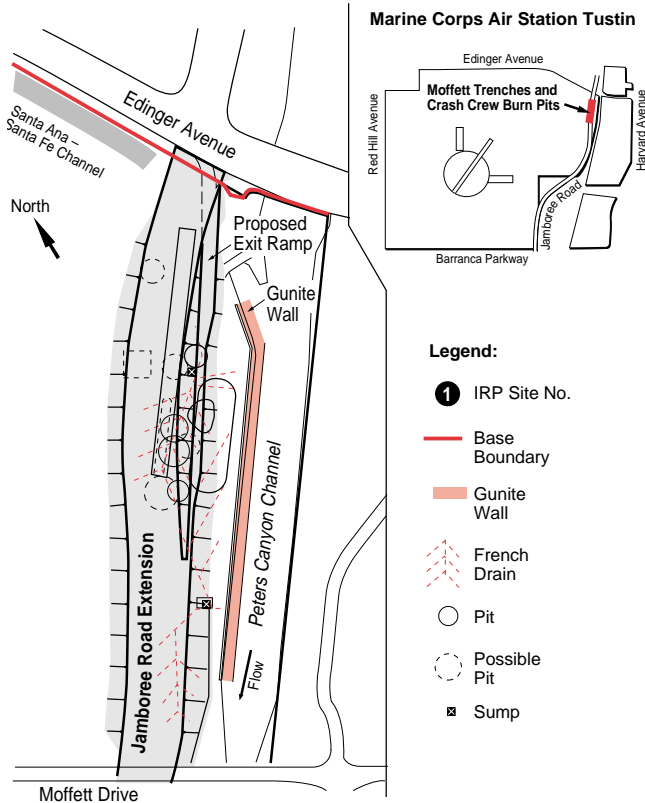


Figure 1

An Administrative Record file is the collection of all reports and documents used by the Marine Corps/Navy in the selection of cleanup alternatives. This collection provides a record of all decisions and actions taken by the Marine Corps/Navy. Such a collection has been compiled for Operable Unit 3 and includes the Remedial Investigation and the Feasibility Study reports. It is available for public review and comment through November 16, 1996. The relevant documents from the Moffett Trenches and Crash Crew Burn Pits area and a complete index of all MCAS Tustin administrative record documents are housed in the Information Repository at:

University of California, Irvine  
Science Library  
Government Publications Department

Call (714) 824-7362 or 824-6836 for current hours and directions.

The complete collection of documents listed in the index is available for review at:

Southwest Division Naval Facilities  
Engineering Command  
1220 Pacific Highway  
San Diego, California 92132-5187

To arrange a time to review documents, contact Chris Potter at (619) 532-1144.

## MCAS Tustin Installation Restoration Program Process

Interim Action	Remedial Investigation (RI)	Feasibility Study (FS)	Public Comment Period	Record of Decision (ROD)	Remedial Design	Remedial Action
COMPLETED						
MOFFETT TRENCHES AND CRASH CREW BURN PITS – OPERABLE UNIT 3						
A cleanup and abatement order is issued in May 1985, resulting in excavation of the burn pits. Interim cleanup activities included constructing a Gunite™ wall and installing a French drain system.	The RI identifies sources and areas of contamination. RI results confirm that interim action activities are still effective. The cleanup and abatement order is rescinded in May 1996.	The FS identifies cleanup options for the contamination problems.	The public now has the opportunity to comment on the alternatives, including MCAS Tustin's preferred alternative. Comments will be considered and responded to in writing.	MCAS Tustin will document the selected cleanup option(s) in the ROD.	Detailed specifications for the selected remedy will be developed.	A qualified contractor will begin the cleanup according to specifications.

**Figure 2.** In addition to Operable Unit 3, other operable units have been established at the base to manage the cleanup of soils and groundwater. A Remedial Investigation report is currently being prepared for these operable units. This report will detail investigation results for these areas and will include human health and ecological risk assessments. A Feasibility Study report discussing the potential cleanup alternatives for these operable units will then be prepared and made available for public review and comment. Additional information on these operable units and other environmental activities around the base will be presented in future fact sheets.

Summary of Cleanup Alternatives

Prior to transfer and reuse of the Operable Unit 3 area (Moffett Trenches and Crash Crew Burn Pits), the Marine Corps/Navy will take necessary steps so the property can be used safely. A wide range of cleanup technologies and activities were considered and evaluated to determine which, by themselves, or when combined with other actions, would be most effective. Some of the cleanup technologies were eliminated during the initial screening because they could not effectively control, reduce, or contain the chemicals. Others could not be implemented at the site or would incur excessive costs compared to other methods that would achieve the same degree of health and environmental protection. The remaining cleanup activities and technologies were combined into four cleanup alternatives and then evaluated against U.S. EPA’s nine criteria. The objectives, components, and costs of the four alternatives are summarized in Figure 3. The alternatives are numbered here as they appear in the Feasibility Study report. The Marine Corps/Navy’s preferred alternative is Alternative 2, Institutional Controls.

Alternative 1 – No Action

By law, this alternative must be considered as a baseline against which other alternatives are compared. This option involves no further remediation measures, no limitations on site access or land use controls, and no monitoring of chemicals at the site. If selected, this alternative would be considered a final remedy for the site and thus no periodic reviews would be conducted to confirm the long-term protection of human health and the environment.

Alternative 2 – Institutional Controls

- **Deed Restrictions**—Prohibit future land uses that are incompatible with the presence of buried waste and impacted subsurface soil and groundwater. The restrictions would prevent human exposure to impacted soil and groundwater by prohibiting the installation of wells in shallow water-bearing zones and by preventing any excavation into landfill materials or subsurface soils.

- **Groundwater and Surface Water Monitoring**—Track future chemical migration and conduct periodic surface water monitoring in Peters Canyon Channel to ensure timely detection of any unexpected chemical releases.
- **Inspection and Maintenance of the Gunitite™ Wall**—Maintain the integrity of the wall through annual inspections and necessary maintenance.
- **Periodic Reviews**—Conduct a detailed analysis of the monitoring data every five years to determine the long-term effectiveness of this remedy and whether more or less monitoring and/or additional cleanup remedies are required.
- **Contingency Plan**—Ensure that additional measures will be taken should migration of contaminants occur at levels not protective of human health or the environment.

Summary of Major Components, Objectives, and Present-Worth Costs for Remedial Alternatives

	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Off-Site Disposal	Alternative 4 On-Site Treatment
Major Components	■ No remedial action	■ Groundwater and surface water monitoring ■ Deed restrictions ■ Inspection and maintenance of Gunitite™ wall ■ Periodic site reviews every five years	All components of Alternative 2 <i>Plus</i> ■ Groundwater extraction ■ Off-site disposal at a California-licensed facility	All components of Alternative 2 <i>Plus</i> ■ Groundwater extraction ■ On-site carbon treatment ■ Permitted discharge to Peters Canyon Channel
Objectives	■ Required by law to serve as a baseline against which other alternatives are compared	■ To limit potential exposures to site-related contaminants while minimizing long-term operation and maintenance activities	■ To remove chemicals in the shallow groundwater aquifer ■ To prevent further lateral or vertical migration of contamination	■ To remove chemicals in the shallow groundwater aquifer ■ To prevent further lateral or vertical migration of contamination
Costs				
Capital Cost	\$0	\$107,000	\$ 174,000	\$ 176,000
O&M* Cost	\$0	\$688,000	\$1,264,000	\$ 888,000
Total Present-Worth** Cost	No associated costs	\$795,000	\$1,438,000	\$1,056,000

\* Operation and Maintenance  
\*\* Defined as the amount of money that would pay for the entire project construction and operation if it were implemented today. Groundwater monitoring is anticipated to occur over a period of 25 years.

Figure 3

Alternative 3 – Off-Site Disposal

This alternative includes all of the components of Alternative 2, including deed restrictions, groundwater and surface water monitoring, inspection and maintenance of the Gunitite™ wall, and periodic reviews. In addition, the following elements would be added:

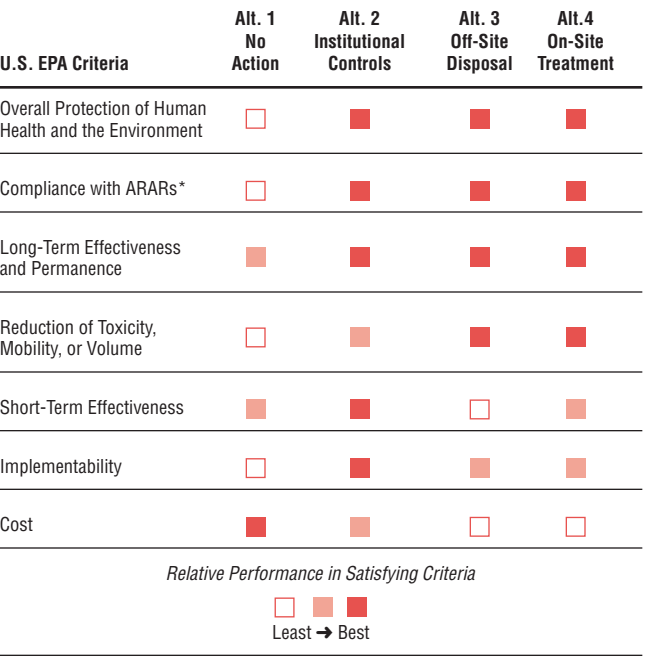
- **Groundwater Extraction System**—Use the French drain system installed in 1987 to extract impacted groundwater from the first water-bearing zone beneath the site. Twice a year, approximately 100,000 gallons of groundwater would be pumped out of two drain sumps by a licensed contractor.
- **Off-Site Disposal**—Transport the extracted groundwater to a State of California-licensed treatment, storage, and disposal (TSD) facility in the Los Angeles metropolitan area. (Details on the transportation and disposal of the water are provided in the Feasibility Study report.)

Alternative 4 – On-Site Treatment

This alternative includes all of the elements of Alternative 2, the groundwater extraction components of Alternative 3, and adds:

- **Groundwater Treatment System**—Operate a mobile treatment unit on-site twice a year to pump water from the French drain sumps. Water would be treated using a carbon adsorption unit. As the water passes through the unit, chemicals adsorb onto the carbon, resulting in treated water that meets discharge or reuse standards. The carbon adsorption unit would operate for an estimated five days during each pumping cycle to treat approximately 100,000 gallons of extracted groundwater. No equipment or supplies associated with the treatment system would remain on-site between the pumping cycles. Because of the relatively small volumes of water that would be collected twice a year, construction of a permanent treatment facility would not be cost-effective.
- **Groundwater Discharge**—Discharge treated water from the carbon adsorption unit to Peters Canyon Channel following testing to confirm that it meets standards set by a National Pollutant Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Control Board.

Comparative Analysis of Alternatives



\* Applicable or relevant and appropriate requirements

Figure 4

Evaluating a Remedy

Each alternative considered by the Marine Corps/Navy has undergone a detailed evaluation and analysis, using a process developed by the U.S. Environmental Protection Agency. The process uses nine evaluation criteria to thoroughly examine potential remedies and narrow down the field of possibilities to the most appropriate remedy for the site. The detailed analysis compares the alternatives in order to identify the relative advantages and disadvantages of each one. The last two criteria, State Acceptance and Community Acceptance, are influenced by comments received during the Proposed Plan comment period. Complete definitions of these criteria are available in the Feasibility Study report. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with Applicable or Relevant and Appropriate Requirements
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume of Contaminants
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

## Marine Corps/Navy's Preferred Alternative for Operable Unit 3

**B**ased on detailed and comparative analyses, the Institutional Controls Alternative (Alternative 2) is the Marine Corps/Navy's preferred alternative for Operable Unit 3 (Moffett Trenches and Crash Crew Burn Pits). The primary rationale for the Marine Corps/Navy's recommendation of Alternative 2 is that it offers:

- Superior or comparable performance for:
  - ✓ overall protection of human health and the environment;
  - ✓ compliance with applicable or relevant and appropriate requirements;
  - ✓ long-term effectiveness and permanence; and
  - ✓ short-term effectiveness; as well as
- A cost-effective means of accomplishing the remedial action objectives for the site.

Other advantages include the ease of implementation (needing minimal on-site construction activities), the compatibility with planned future land uses, and the provision for future assessments to evaluate performance. The structural integrity of the French drains and sumps will not be affected by the implementation of Alternative 2. The drains will remain operable and could still be used in the unlikely event that changing environmental or land use conditions require a more active response.

In addition, the current lack of chemical movement and realistic human health exposure pathways for the chemicals in the groundwater make the additional costs associated with groundwater extraction and disposal (Alternatives 3 and 4) unwarranted. See Figure 4 for a graphic comparison of the alternatives analysis.

## Multi-Agency Environmental Team Concurs on Alternatives

**W**ith fast-track cleanup activities under way and the decision to close MCAS Tustin by 1999, the Department of Defense has formed a team with the State of California Environmental Protection Agency and the U.S. Environmental Protection Agency to coordinate the Installation Restoration Program.

The primary goals of this BRAC Cleanup Team are to support the protection of human health and the environment and to expedite the closure and reuse of the base. The team also serves as the primary forum for assessing cleanup priorities and progress, and obtaining consensus on issues regarding the base's environmental activities.

The team recently completed its review of the draft Operable Unit 3 (Moffett Trenches and Crash Crew Burn Pits

site) Remedial Investigation and Feasibility Study reports. Discussions were held regarding all the alternatives presented by the Marine Corps/Navy and concurrence was gained by the team to recommend Alternative 2 to the public as its preferred remedy. In addition, all ongoing and planned activities for the Moffett Trenches and Crash Crew Burn Pits — Operable Unit 3 — program presented in this proposed plan are in compliance with the State of California EPA's regulatory requirements stated in Health and Safety Code section 25356.1.

The community-based Restoration Advisory Board recently reviewed the draft Operable Unit 3 reports, and provided their comments to the Marine Corps/Navy for consideration, concurring that Alternative 2 is also their preferred remedy.

## For Additional Information

The Marine Corps/Navy encourages community involvement in the decision-making process of the environmental restoration program at MCAS Tustin. If you have any questions or concerns about environmental activities at the base, please feel free to contact any of the following project representatives:

- Mr. Steven Matthews, Community Point-of-Contact, MCAS Tustin (714)726-5757
- 1st Lt. Arnoux Abraham, Joint Public Affairs Office, Marine Corps Air Bases, Western Area (714) 726-2937
- Ms. Marsha Mingay, Public Participation Specialist California State Environmental Protection Agency (310) 590-4881

### Mailing Coupon

☐ I would like to be added to the MCAS Tustin environmental restoration program mailing list.

☐ I would like to receive information on Restoration Advisory Board membership.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Affiliation (optional) \_\_\_\_\_ Telephone \_\_\_\_\_

Mail to: Steven Matthews, Community Point-of-Contact, MCAS Tustin, Attn: HQ, BRAC, Code 2AS, P.O. Box 105001, Santa Ana, CA 92710-5001

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# MCAS Tustin Moffett Trenches and Crash Crew Burn Pits Remedial Investigation Highlights



## Site Background

### Historical Use of the Land

The Moffett Trenches and Crash Crew Burn Pits site at MCAS Tustin are shallow, unlined landfill trenches and pits. The site location on the base is shown in Figure 1. The pits were constructed to burn liquids during fire-fighter training exercises conducted from about 1971 to 1983. These liquids were primarily jet propellant fuel, as well as oils, solvents, lacquers, and primers. The trenches, containing approximately 5,000 cubic yards of material, were used from approximately 1950 until the early 1970s to dispose of MCAS Tustin-generated municipal and industrial wastes, including paints, oils, and solvents. The exact number and size of the landfill trenches and burn pits are unknown, and some trenches and pits were apparently constructed over older sections of the trenches. It is estimated, from aerial photographs and historical information, that the area covered by the trenches and pits is approximately 600 by 250 feet.

### Impact of Landfill and Pits on the Environment

In 1983, chemicals were found to be seeping into Peters Canyon Channel from the area of the burn pits. The Marine Corps/Navy conducted investigations which indicated that the chemicals from the site had moved through the soil and impacted some of the water in the immediate area. In May 1985, the California Regional Water Quality Control Board (RWQCB), Santa Ana Region, issued a Cleanup and Abatement Order to MCAS Tustin, requiring that the base take action to remove or control these chemicals.

### Schematic of Existing Control Measures at Moffett Trenches and Crash Crew Burn Pits

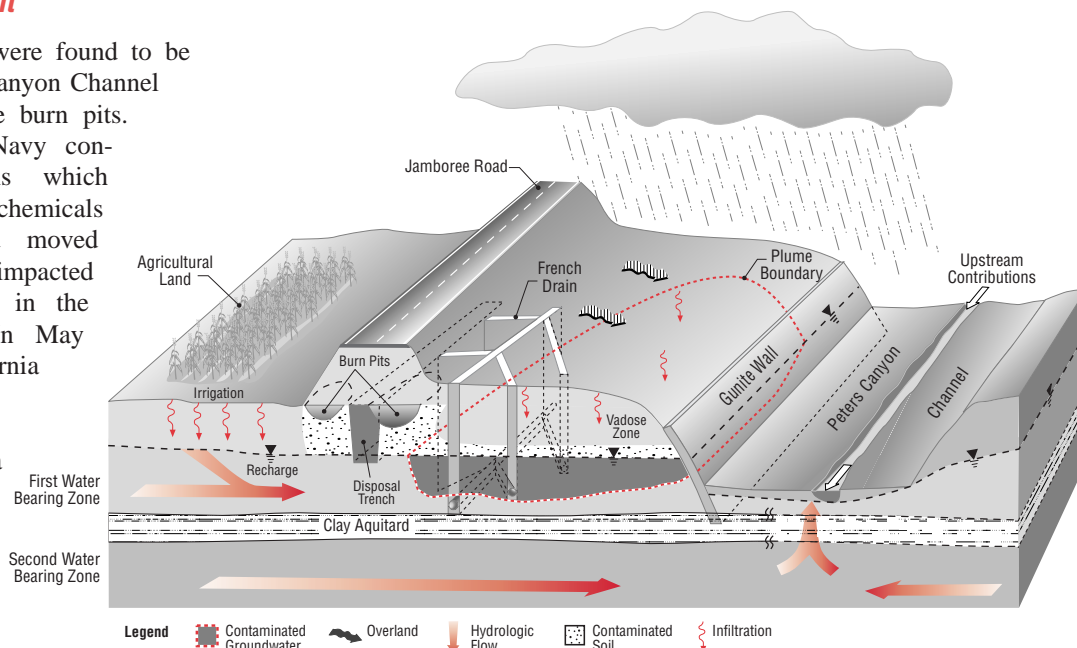


Figure 5

### Interim Cleanup Actions Taken

To comply with the Cleanup and Abatement Order, the Marine Corps/Navy excavated approximately 10,000 cubic yards of soil from the burn pits in 1986. The soil was hauled to a State of California-approved hazardous waste disposal facility. The area was then covered with clean soil. Interim cleanup activities included constructing a Gunitite™ (cement and synthetic liner) wall along the west bank of Peters Canyon Channel to stop groundwater containing chemicals from flowing into the channel. In addition, a French drain system was constructed beneath the site in 1987 to collect and extract groundwater flowing through the impacted soil. In the past, this water has been hauled off-site to an approved hazardous waste facility. Figure 5 illustrates the control measures in place to keep the chemicals from migrating.

The 1996 investigation determined that these interim measures, the Gunitite™ wall and French drain collection system, are still effective in collecting the groundwater that may be impacted by residual chemicals. The investigation results indicate only minimal adverse impacts on the environment since the original detection of the chemicals in 1983. As a result, the RWQCB formally rescinded the Cleanup and Abatement Order in May 1996. Presently, much of the site is covered by Jamboree Road, which was constructed in the late 1980s.

### Site Future

Future land use plans for this site include elevating Jamboree Road to create an overpass over Edinger Avenue. Construction activities for the overpass are scheduled to begin in early 1997. Together, the Marine Corps/Navy and the Orange County Environmental Management Agency will ensure that the design and construction of the overpass are carried out in harmony with the cleanup activities selected for the site.

## Summary of Investigation Results

The results of this investigation confirm that soil and groundwater at Operable Unit 3 contain chemicals originating from the burn pits and disposal trenches. The investigation also confirms that most of the chemicals in the soil are found at approximately 10 to 20 feet below ground surface. The chemicals detected in groundwater were in the first water-bearing zone, which extends from approximately 10 to 25 feet below the surface. Principal chemicals include petroleum hydrocarbons, volatile organic compounds (VOCs), semivolatile organic compounds, and, to a lesser extent, metals. VOCs are a subgroup of organic chemicals characterized by their tendency to evaporate or volatilize readily. Substances used at the base that contain VOCs include solvents, paint thinners, and gasoline.

The impacted groundwater appears to be contained beneath the site by the Gunitite™ wall along the west bank of Peters Canyon Channel. In addition, there is evidence that naturally occurring biodegradation of organic chemicals is taking place in the subsurface and that there is a continuous layer of clay (aquitard) beneath the first water-bearing zone which keeps the groundwater from moving into deeper zones. It is, therefore, expected that future off-site migration of impacted groundwater will be minimal.

It was determined that the groundwater in deeper water-bearing zones, surface water, and sediment in Peters Canyon Channel are not affected by these chemicals. Additional details on the field investigation, as well as a list of chemicals and their detected levels in the soil and groundwater, are contained in the Remedial Investigation report available at the information repository.

## Human Health and Ecological Risk Assessments

Human health and environmental risk assessments are used to determine if environmental cleanup is necessary at a site. The decision to conduct a cleanup is based upon the potential presence of materials that could affect human health or the environment. To assess such potential effects, information on the type and amount of materials at a site is collected through environmental studies. These studies also determine if materials are moving from the site to the surrounding air, soil, or water (both surface water and groundwater). The next step is to identify possible exposure pathways, which could tell us who, what, when, where, and how people, plants, and animals could come in contact with these materials. People, plants, and animals that could be exposed are called receptors. Finally, the possible health effects from exposure to each material are evaluated and combined with other information from the site to calculate potential health and environmental risks.

### Human Health Risk Assessment

The human health portion of the risk assessment for Operable Unit 3 evaluated the possible exposure to surface water and sediments from Peters Canyon Channel and shallow groundwater. Ingestion of sediments, inhalation of dust, and skin contact were considered possible exposure pathways at Peters Canyon Channel. For the purpose of this risk assessment, drinking groundwater was considered to be a possible exposure pathway to materials from the site.

### Ecological Risk Assessment

A risk assessment was also conducted to evaluate effects on animals from ingesting water and sediments from the channel. For this assessment, the mallard duck and the great blue heron were the animals evaluated. It was concluded that there is little chance that any of the chemicals of potential concern pose a risk to the population of either animal.

Human Health Risk Assessment Summary				
Exposure Pathway	Carcinogenic Risk		Noncarcinogenic Hazard Index	
	Regulatory Standard	OU-3 Levels	Regulatory Standard	OU-3 Levels
Sediment & Surface Water	$1 \times 10^{-4}$ to $1 \times 10^{-6}$	$3 \times 10^{-6}$	1.0	0.11
Levels within or below protective limits.				
Surface & Subsurface Soil	$1 \times 10^{-4}$ to $1 \times 10^{-6}$	**	1.0	**
**No risk was calculated because the investigation did not fully characterize the soils and buried wastes. Wastes will be left in place and exposure to subsurface materials is not expected to occur.				
Groundwater	$1 \times 10^{-4}$ to $1 \times 10^{-6}$	$2.5 \times 10^{-3}$	1.0	58
Risk is unacceptable if the groundwater were to be used for drinking. However, since reuse plans do not call for any residential use of this groundwater, the risk of exposure has been determined to be extremely low. (Naturally occurring salt levels are too high for consumption even if the water were otherwise clean.)				

Figure 6 summarizes the results of the human health risk assessment for possible carcinogenic (cancer-causing) and noncarcinogenic materials at Operable Unit 3. The carcinogenic risk is expressed in terms of the chance of humans contracting cancer as a result of being exposed to materials from the site for 30 years. To be protective of human health, the U.S. Environmental Protection Agency (U.S. EPA) has set the range of  $1 \times 10^{-4}$  (one person in a population of 10,000 may contract cancer) to  $1 \times 10^{-6}$  (one person in 1,000,000) as the target for management of carcinogenic risk. Health risk for noncarcinogenic materials is expressed as a hazard index. This is calculated by comparing the actual or potential exposure level to a known, safe level. The U.S. EPA considers a hazard index of 1.0 or less as protective of public health. A hazard index value greater than 1.0 means there is a possibility of health effects and that additional actions are necessary.